

Critical Success Factors for Pedagogy 2.0

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Abstract

This research is exploring Web 2.0 adoption and success in education. Web 2.0 technological innovation is introduced and defined highlighting different tools and applications. This research develops a framework to govern Web 2.0 introduction in teaching and learning made of different factors. It was suggested here that the adoption and hence, the assimilation of Web 2.0 in teaching and learning is not a straight-forward process and hence needs careful consideration of different Web 2.0 issues in relation to pedagogy with technology is being looked at as a conduit to deliver more effective educational services. Web 2.0 has many advantages, disadvantages and at the same time, posits different implications and challenges for educators, professionals and policymakers.

1. Introduction

Advancement in technology has revolutionized and reshaped teaching and learning in unprecedented way. This argument is so impending that many researchers questioned the efficacy of existing assessment techniques and accused them of being as shallow and as less reflective to the contemporary needs of both technological society students and academic staff. More specifically, they fail to assess critical learning issues such as problem solving, critical thinking, collaboration, innovation and creativity (Smith & Peck, 2010). As a result, they called for the introduction of more appropriate approaches such as blended learning which contains different types of education techniques and technologies, e.g., face to face education and online learning activities (Köse, 2010). In a nutshell, there is a need to create more effective pedagogical approaches to better equip students for the professional life (Augustsson, 2010; Grosseck, 2009). Wu and Hsu (2009) highlighted that although traditional education with a technology assistant is the trend in current educational practices, emerging technologies provide opportunities for not only instructor-student, but also student-student, real-time, and/or time-delayed collaboration. In higher education, Internet technology has evolved from being a vehicle to distribute course materials, communicate (e-learning) and evaluate, to enhancing educational processes that support collaborative student learning (Maloney, 2007).

Recently, latest technological variants namely Web 2.0 emerged as powerful enablers to support and enhance in-class teaching and learning in higher education (Baltaci-Goktalaya & Ozdilek, 2010; Grosseck, 2009). Wu and Hsu (2009) highlighted that Web 2.0 tools have shaken every field including education. This is so looming that Web 2.0 is considered by many educators to be the next thing in education and the one that will attract the attention of students who viewed current educational practices negatively and accused them of being as stagnant and as not evolving to meet contemporary learning needs (Wikipedia, 2011).

Web 2.0

The term Web 2.0 first emerged in January 1999 by Darcy DiNucci, a consultant on electronic information design but the real Web 2.0 that we know it nowadays resurfaced in 2003 (Wikipedia, 2011). There are many definitions for Web 2.0 but almost all definitions agree on defining it as the social use of the Web which allow people to collaborate, to get actively involved in creating content, to generate knowledge and to share information online (Grosseck, 2009). The term Web 2.0 is associated with Web applications that facilitate participatory information sharing, interoperability, user-centered design, and collaboration on the World Wide Web (Wikipedia, 2011).

Unlike Web 1 (read only), Web 2.0 (read/write) propelled by social-sharing capabilities, is introduced as the new technological buzz in education to support teaching and learning. In online social networks, collaborations amongst students is highly emphasized and hence, evaluating the adaptation of Web based systems with Web 2.0 features is important as Web 2.0 in addition to introducing new types of Web content, it brings a new level of interface design in Web development (Sabouri & Jalali, 2009). It also entails cumulative changes in the ways software developers and end-users use the Web (Wikipedia, 2011). Thus, Web 2.0 provides users with more user-friendly interface, software and storage facilities which enable them to add value to the application they are using. Hence, Web 2.0 allows users create, describe, post, search, collaborate, share and communicate online content in various forms (Tripathim & Kumar, 2010), e.g., music, bookmarks, photographs, documents, commenting, tagging, and ratings.

Web 2.0 features

O'Reilly (2006) provided the following characteristics of Web 2.0:

- a. user as contributor.
- b. Participation not publishing
- c. Lightweight programming models
- d. Trust and collaboration
- e. Software above the level of any single device
- f. A rich user experience

Web 2.0 draws together the capabilities of client- and server-side software, content syndication and the use of network protocols. Standards-oriented web browsers may use plug-ins and software extensions to handle the content and the user interactions.

Web 2.0 components

Thus, Web 2.0 can be described in three parts which are as follows (Wikipedia, 2011):

- a. Rich Internet application (RIA) on the browser side from a graphical or usability point of view, e.g., using Ajax and Flash.
- b. Service-oriented architecture (SOA)— defines how Web 2.0 applications expose its functionality to other applications to integrate with providing a set of much richer applications, e.g., Feeds, RSS, Web Services, Mash-ups.
- c. Social Web — It defines how Web 2.0 integrates and interacts much more with the end user.

Web 2.0 tools

Web 2.0 includes blogs (Blogger, WordPress), micro-blogs, wikis (Seedwiki, Wikipedia), syndication of content through RSS, tag-based folksonomies, media sharing, social networking (Facebook, YouTube, MySpace), social bookmarking (Digg, de.licio.us), Instant messaging (MSN Messenger), Internet Telephony (Skype), Audio/Video Conferencing (NetMeeting), hosted services, web applications, and mashups. Other Web 2.0 applications such as Voice-Thread allows the use of different types of media (images, documents and video) where individuals or groups could use their voice to comment (with a microphone or telephone) in different ways: text, audio file or video (with a webcam) (Augustsson, 2010). The latest generation of Web 2.0 technologies are becoming more ubiquitous, offering many unique and powerful information, sharing and collaboration features. Grosbeck (2009) provided examples of using Web 2.0 technologies in education, e.g., prepare and collect materials, evaluating and analyzing the progress made by students, putting together informative and formative presentations, time management, planning the timetable and the calendar of activities, developing projects in collaboration, digital storytelling, students' e-portfolios, etc.

Web 2.0 Implications

At the outset, researchers viewed Web 2.0 tools as having a pervasive impact on society (Tripathim & Kumar, 2010). Teachers viewed using Web 2.0 technologies as supporting their courses positively and as improving learning and interaction among learners and teachers (Baltaci-Goktalaya & Ozdilek, 2010). Web 2.0 integration into the classroom learning environment can be effective at increasing students' satisfaction with the course, improve their learning and their writing ability, and increase student interaction with other students and faculty; thus changing the students' role from passive to active learners, allowing them to better create and retain knowledge (Ajjan & Hartshorne, 2008). On the other hand, Augustsson (2010) found Web 2.0 technology useful as a valuable supplement in a campus course where other teaching takes place in time and space. In contrast, other researchers accused Web 2.0 of being a marketing gambit which will eventually vanish like its predecessors of overhyped technologies (Dilger, 2010). Similarly, Tripathim and Kumar (2010) found the literature pointing to Web 2.0 as a hype, an attitude and does not represent any advancement in technology and that it's a mere a technological change. Other critics called the Web 2.0 as a piece of jargon, difficult to understand and it cannot possible be right. While Web 2.0 may provide rational debate and collaboration, it may also lead to the possibility for "spamming" and "trolling" by less rational users which may force rational members opt-out from

contributing – this requires radical trust by the management of the website (Wikipedia, 2011). Wikipedia (2011) also raised the possibility of Web 2.0 undermining the value of expertise by allowing anybody from anywhere to cast their own opinions and post any kind of content regardless of their backgrounds, knowledge, credentials, biases or possible hidden agendas.

Between proponents and opponents, there is no doubt that Web 2.0 is gaining new grounds every day in different areas including education. It is clear however that for this juncture to stand, many implications needs to be resolved first. This research is interested to explore the importance of using the Web 2.0 in education highlighting different constituents and impacting factors in both learning and teaching. Thus, this research is interested in finding answers to the following research question: *How can we use Web 2.0 more effectively in learning and teaching.*

In the following, the research progress a guiding theoretical framework and attempt to link it to Web 2.0 factors. The research ends with a discussion and conclusion section.

2. Reference Theory

In search for appropriate framework to guide this research endeavor identify potential determinants of technology adoption the Technological Innovation Theories (TOT) appeared to be more prevalent amongst researchers. The adoption and diffusion of information technologies by individuals and organizations is part of the process of information systems implementation (Kwon & Zmud, 1987; Moore & Benbasat, 1991, 1996). Innovation diffusion refers to the spread of innovations through a community of firms over time whilst adoption refers to the decision (adopt/reject) within a firm to make full use of a new idea as the best course of action (Rogers, 1983, 1995). Rogers (1983, 1995) reviewed several thousand innovation studies and developed a framework that envisions a simple innovation diffusion sequence. The sequence leads from knowledge acquisition to persuasion of interest, followed by the adoption or rejection decision itself, implementation, and finally the confirmation stage of evaluating the actual outcomes compared with expectations. In view of the technological innovation theories, Rogers' (1995) model appeared to be the most widely accepted model by researchers in identifying 'perceived' critical characteristics for innovations in IS research (Kaplan 1999; Karahanna et al. 1999; Moore & Benbasat 1991, 1996). Rogers (1995) identified five significant characteristics of the innovation which influences its adoption:

- a. Relative advantage: the degree to which an innovation is perceived as being better than its precursor;
- b. Compatibility: the degree to which an innovation is perceived as being consistent with the existing values, needs and past experiences of potential adopters;
- c. Complexity: the degree to which an innovation is perceived as being difficult to use;
- d. Trialability: The degree to which an innovation may be experimented with before adoption.
- e. Observability: the degree to which the results of an innovation are observable by others.

In their review of adoption literature Premkumar and Roberts (1999), Thong (1999) and Tornatzky and Klein (1982) endorsed Rogers' (1995) innovation characteristics and found the first three factors consistently associated with innovation adoption. However, past studies found that facilitation factors vary according to the innovation type (Swanson, 1994). Thus, extending or adapting contexts and factors developed in earlier IS research on Web 2.0 adoption is not a straightforward process, simply because Web 2.0 introduces features of its own. Accordingly, this research will examine these three factors but from within the ICT/IWBT pedagogy literature in order to develop the guiding theoretical framework. In emphasizing the importance of this framework, Ajjan and Hartshorne (2008) argued that for Web 2.0 to succeed among educators, more effort is needed to improve the perceived usefulness, ease of use, and compatibility (with current practices) of Web 2.0 applications and faculty's self-efficacy. They further emphasized the need to provide "best practices" models to further facilitate the adoption of Web 2.0 in higher education. In the following, the above framework is discussed from within Web 2.0 pedagogical literature.

3. Web 2.0 advantages

Web 2.0 technologies like YouTube stimulate (student work is open to peer review) and satisfy (enjoyment, contemporary, building self-confidence) the learning needs of both graduate and undergraduate students and allow for more active participation and engagement (i.e., improves visual literacy) from students (Smith & Peck, 2010). Thus, Web 2.0 technology is well suited for collaborative learning, collective knowledge building, knowledge management, social networking and social interaction, which means that both course participants and teachers become more active and personally involved (Maloney, 2007). By using Web 2.0, teachers are giving students the freedom to learn for themselves and share that learning with their peers (Wikipedia, 2011) and hence, teachers are given more time to effectively facilitate the teaching and learning process. In a review of the literature concerning Web 2.0 support for collaborative learning and reflections, Augustsson (2010) found that Web 2.0:

- a. provides support for students' reflections on their own thoughts and reflections about emotions
- b. enhances identification and collaboration between students
- c. according to (i&ii) Web 2.0 supports the development of students' self-awareness in demarcated contexts, for example when they collaborate towards specific goals. Thus, it supports individual students and integrates them into a work group
- d. develops students' identification and awareness in relation to self, a task and others.

Grosbeck (2009) emphasized that teachers can foster collaborative work not only among their own students but with colleagues, students, and community members from around the world – and provided the following Web 2.0 advantages for higher education:

- a. reduction of costs
- b. flexibility

- c. easier and faster access to information, when and where it is needed
- d. the integration of a variety of Web 2.0 technologies in the teaching-learning activities;
- e. extensive opportunities of information and collaboration by the agency of social bookmarking services
- f. possibility to control access to resources by authenticating users
- g. sharing accumulated experiences (blogs, microblogs, wikis, Flickr, YouTube) and resources
- h. independence from the platform
- i. compatibility with the elements of the educational field and the existing contextual dynamics
- j. the low level of complexity needed for use
- k. reliability in continuous usage, over an extended period of time
- l. redistribution of effort, so that less and less time and energy are spent during search and information management
- m. (del.icio.us, RSS)
- n. the increase in number of modalities of use and the heterogeneity of didactic practices and of types of formation
- o. due to the diversity of the new technologies
- p. the possibility to test the existing didactic practices, without great changes in the current modus operandi;
- q. the major focus on didactic (educational) innovation, and not on the technology per se
- r. creating digital content (especially media, podcasting, videocasting)

4. Web 2.0 compatibility & Complexity

However, the pace on which such technologies develop imposes tremendous challenges on both students and teachers. Hence, the implications here are threefold.

Initially, to many educators Web 2.0 is largely unknown where more research is needed to explore the efficacy of Web 2.0 in teaching and learning and more focused training programs are needed to up-skill teachers' knowledge with Web 2.0-pedagogy (Grosbeck, 2009). For example, while some teachers feel that some Web 2.0 technologies could improve students' learning, their interaction with faculty and with other peers, their writing abilities, and their satisfaction with the course; few choose to use them in the classroom (Ajjan & Hartshorne, 2008). Further the attitude and hence, the impact of Web 2.0 in education varies amongst educators (Grosbeck, 2009):

- a. Producing a short circuit in the reflection and debate on the impact this new technological trend has on education;
- b. Rejecting the new by saying that we shouldn't tolerate „the vassalage to American culture“;
- c. Technological immaturity, wrecked by indifference and by the absence of openness towards new ideas and didactic experiences;
- d. Intellectual and academic dogmatism;
- e. The hardening of scientific thought;
- f. The erosion of creativity;
- g. Taking up an opportunistic attitude and acquiring the ambiguous identity of an information cool/groovy;

- h. Limiting oneself to the periphery of intellectual work methodologies (in the context of proliferating Web 2.0.0 without being sufficiently informed, we risk offering the students a precarious training);
- i. Annoyed reactions from “basement communities” which can, many times, be tempted to consider introducing Web2.0 technologies in their institutions as mere whims;
- j. Tensioning work relations and creating notoriety complexes as far as the colleagues who have adopted the new wave of the Web are concerned, etc.
- k. Under these circumstances, we believe it is necessary to reconsider the role of educators. Thus, we need to:
 - Assume a new attitude (without going to extremes);
 - Set ourselves up as innovators in education, by promoting new pedagogical objects: courses under an audio/video form (podcasts, videocasts), books/manuals in the shape of a wiki, communicating with our students through blogs etc.;
 - Try to bring arguments in favor of a taking a correct stand when faced with these realities;
 - Plead in favor of renewing our psycho-pedagogical tools;
 - Enjoy the pleasure offered by the act of knowledge;
 - Assume responsibility for our own formation
 - work a lot, spend a great amount of time for self-training, sometimes to the detriment of spending time with the family or of relaxing.

Secondly, technology savvy students may ridicule the use of existing and traditional teaching and learning approaches (Smith & Peck, 2010). Those students are already raised on new media technologies, participate at a global level and receive better online feedback (Wikipedia, 2011). Such students are no longer satisfied with retrieving information from the Web only but need to be involved in the process by creating and sharing content. For Web 2.0 to succeed in education, students need to prove (Grosseck, 2009):

- a. initiative and responsibility,
- b. curiosity and imagination,
- c. the ability to explore
- d. creativity,
- e. to work cooperatively and constructively,
- f. to communicate and collaborate distinctly with each other,
- g. to be open towards identifying and solving problems.
- h. to carry a fruitful dialogue, on both educational and social issues.

Finally, the use of advanced technologies and approaches to enrich the student learning experience means bringing the whole student audience to an equal footing in terms of comprehending the technological tool itself let alone liking it in the first place and above all, to accept using it. This is important as Wu and Hsu (2009) reported an enhancement in student performance when using Web 2.0 but younger participants showed more interest in Web 2.0. Further, this enhancement was significantly different between male and

female with the later reporting having more positive attitudes toward Web 2.0. Above all, educators need to master such technologies in the first place to be able to design effective assessment tools as stated earlier.

Interestingly, Smith and Peck (2010) warned that failing to consider the complexities introduced by technology may position the student as the digital victim (engaged in learning about the tool itself and not the task) and the teacher as the digital perpetrator (in their attempt to use Web 2.0 in designing a task for students). They highlighted the need to work towards more collaborative outcomes for both student and academic to bridge the (generational) gap between what students see as assistive to learning and what the teacher sees as helpful to assessment. In the same vein, Grosseck (2009) supported the need to properly introduce the new Web 2.0 technologies in the curriculum and to make students more responsible about their learning to become effective partners in the teaching-learning process and warned that abusing Web 2.0 can block or annihilate information processing, and can decrease the quality of learning. Grosseck (2009) provided other Web 2.0 challenges for higher education:

- a. an Internet connection is required (especially a broadband connection);
- b. it hides behind it a sum of technologies and concepts which are still insufficiently defined;
- c. it is based on Ajax, which depends on JavaScript and, therefore, a user without activated JavaScript, won't be able to use the respective page;
- d. it determines variations of interpretation between types of browsers;
- e. it offers free things, in open-source structures, with a rather vague significance;
- f. it leads to a low quality of the actual content, with sites which struggle in deep informational mediocrity;
- g. it promotes amateurishness by invaluable contents generated by users;
- h. it gives everyone the opportunity to complain, thus creating a community without rules;
- i. it has monetary quantification (the Internet as a business - Google);
- j. it is a kind of second-hand Web, a medium for persons with low digital abilities;
- k. it has limited security;
- l. the speed of programs is incomparably lower than the one of desktop programs;
- m. it doesn't mean anything per se, it is just electronic junk;
- n. the extremely diversified offer of technologies which can be used and which exist on the market at the moment, make the actual selection process difficult;
- o. time and knowledge invested in the Web 2.0.0 technologies.

Sabouri and Jalali (2009) emphasized that although both online social networks and online collaboration sites have the collaboration aspect in common but they differ in the types of collaboration. While the former tends to be limited to sharing of information, comments, and media the later demonstrates much stronger user collaboration.

5. Discussion and conclusion

It is clear that the success of learning and teaching is fully dependent upon the efficient integration and alignment of such technology with learning and teaching processes. It is emphasized here that this should be done from a pedagogical perspective (Grosseck, 2009) and student's centered. This calls for rethinking the efficacy of existing teaching methods, demanding curriculum (full of theoretical concepts), other extremes which claims to offer intellectual flexibility curriculum and considering programs which involve those competencies which are useful to the future graduate in finding a job (Grosseck, 2009). Students use Web 2.0 tools in their social lives but in education, careful consideration is needed to attract such student use Web 2.0 in their learning.

This research endeavored to explore the multi-faceted perspectives of Web 2.0 technology in education by defining it and highlighting its different tools and their use in pedagogy. The research then proposed a guiding theoretical framework based on the technological innovation literature as a reference theory. The research then attempted to link the framework with Web 2.0 advantages and disadvantages raising different theoretical and professional implications. In the next phase of this research, an attempt will be made to investigate Web 2.0 penetration in education, namely in teaching and learning by faculty and students. Most importantly, there is a need to develop more accurate measures as Tripathim and Kumar (2010) asserted the scant availability of complete set of parameters or standards for evaluating Web 2.0 tools.

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